COMPARATIVE ANALYSIS OF CONSTRUCTION SEDIMENT LOADING/INFLUENT AND EFFLUENT DISCHARGE ESTIMATES
January 2009

Using available data sources, Pechan prepared two comparisons between construction sediment estimates developed by EPA and total suspended solids influent/discharge levels. These are:

1) Comparison of EPA "national" estimates of levels of total suspended solids (TSS) influent to sediment basins and equivalent actual influent measurements at a number of construction sites; and

2) Comparisons of EPA "national" estimates of effluent TSS levels after sediment basin treatment to post-sediment basin discharge estimates reported in the literature.

These comparisons suggest that EPA has both overstated the potential sediment load from construction sites, and also understated the effectiveness of best management practices (BMPs), including sediment basins.

Comparison 1: Measured TSS Influent to Sediment Basins

This comparison relies on EPA's 11 indicator city sediment load estimates and actual measured TSS values for 14 construction sites. It is important to point out that these influent comparisons are an "apples-to-oranges" comparison because EPA chose not to account for any BMPs in calculating influent going into their modeled sediment basins.

Table 1 displays summary data for each of the 14 sites for which actual TSS values were identified. Sites 1-12 are reported in the article entitled "The Limits of Settling," from *Watershed Protection Techniques 2(3): 429-433,* Center for Watershed Protection, June 12, 2003. Sites 13 and 14 are discussed in EPA's technical development document (TDD) for the proposed Effluent Limitation Guidelines for the Construction and Development (C&D) industry.[1]

EPA has provided average, low-end, and high-end estimates of untreated TSS influent for model construction sites for each of 11 indicator cities in "Loads Translated to Concentrations," available under Docket ID EPA-HQ-OW-2008-0465-0488. Table 2 shows EPA's TSS estimates average more than 20 times higher (~90,400 mg/L vs. ~3,900 mg/L) than the actual measured influent data. As noted earlier, however, EPA's sediment load estimates exclude the effects of BMPs, so they would be expected to be somewhat higher than the values measured on actual construction sites.

[1] U.S. Environmental Protection Agency, *Development Document for Proposed Effluent Guidelines and Standards for the Construction & Development Category*, Office of Water, November 21, 2008.

Table 1. Measured TSS Influent Values

Site		Mean Influent (mg/L)
1.	SR-204	3,502
2.	Seattle[2]	17,500
3.	Mercer Island	1,087
4.	RT1	359
5.	RT2	4,623
6.	SB1	625
7.	SB2	415
8.	SB4	2,670
9.	Pennsylvania Test Basin	9,700
10.	Georgia Model	1,500-4,500
11.	Maryland Model	1,000-5,000
12.	Uncontrolled Site (MD)	4,200
13.	TDD, Austin, Texas	600
14.	TDD, Hamilton Co., Ohio	2,950
Mean[3]		**3,874**

Table 2. EPA Influent TSS (mg/L) Estimates for Indicator Cities

Indicator City	Low	Average	High
Albany, NY	5,984	9,874	13,764
Atlanta, Georgia	113,356	155,267	197,179
Boise, ID	15,590	23,385	31,179
Chicago, IL	28,074	38,435	48,796
Dallas, TX	21,733	31,241	40,749
Denver, CO	122,821	175,103	227,384
Kansas City, KS	28,900	47,263	65,627
Las Vegas, NV	98,328	190,872	283,417
Manchester, NH	61,495	78,516	95,537
Seattle, WA	88,949	125,593	162,237
Washington, DC	82,550	119,326	156,103
Mean	**60,707**	**90,443**	**120,179**

[2] It should be noted that the influent TSS for Seattle is based on a single sample from a single very heavy rain event.

[3] In calculating the mean influent, the midpoint of the model ranges is used. For example, for the Georgia Model, the influent value is (1,500+4,500)/2 = 3,000 TSS.

Comparison 2: TSS Effluent from Sediment Basin

A "cleaner" comparison can be made between post-sediment basin TSS values since EPA also developed TSS estimates for effluent after treatment in the sediment basins currently required in each state.

Table 3 displays the available post-sediment basin TSS effluent values from the sites identified in Table 1 (note that two of these sites do not appear because Site 12 was uncontrolled, and no effluent value was available for Site 13). EPA provided average, low-end and high-end estimates of post-sediment basin sediment TSS for model construction sites for each of the 11 indicator cities (see Table 4). The EPA's average TSS estimates are almost 50 times higher (~32,600 mg/L vs. ~700 mg/L) than the actual measured effluent. The measured influent/effluent data reflect a mean 84 percent reduction in TSS from sediment basin treatment. This compares to an average 64 percent reduction computed from EPA's influent/effluent estimates for the 11 indicator cities.

Table 3. Measured TSS Effluent Values

Site		Mean Effluent (mg/L)
1.	SR-204	154
2.	Seattle	626
3.	Mercer Island	63
4.	RT1	224
5.	RT2	127
6.	SB1	322
7.	SB2	91
8.	SB4	876
9.	Pennsylvania Test Basin	800
10.	Georgia Model	200-1,000
11.	Maryland Model	200-1,200
13.	TDD, Austin, Texas	Unavailable
14.	TDD, Hamilton Co., Ohio	3,507
Mean[4]		**674**

Table 4. EPA Effluent TSS (mg/L) Estimates for Indicator Cities

Indicator City	Low	Average	High
Albany, NY	2,992	4,937	6,882
Atlanta, Georgia	39,675	54,344	69,013
Boise, ID	6,392	9,588	12,784
Chicago, IL	19,091	26,136	33,181
Dallas, TX	13,257	19,057	24,857
Denver, CO	42,987	61,286	79,585
Kansas City, KS	26,010	42,537	59,064
Las Vegas, NV	17,699	34,357	51,015
Manchester, NH	16,604	21,199	25,794
Seattle, WA	25,795	36,422	47,049
Washington, DC	33,845	48,924	64,002
Mean	**22,213**	**32,617**	**43,021**

[4] In calculating the mean effluent, the midpoint of the model ranges is used. For example, for the Georgia Model, the influent value is (200+1,000)/2 = 600 TSS.